

OPTIMISING THE GEOMETRY OF SMOOTHED CONTOUR LINES ON BATHYMETRIC MAPS

Hennau Marc and Alain De Wulf

Afdeling Geomatica , Vakgroep Geografie, Universiteit Gent
Krijgslaan 281 S8, B-9000 Gent, Belgium
E-mail: marc.hennau@Ugent.be

Perhaps the most classic way to represent 3D-objects, like the DTM from a bathymetric survey, on a 2D medium is by generating contour lines. The sight of an unsmoothed contour map can be too rough and therefore being rejected by the map users, especially when a shelving surface is being represented. However, many users object to smoothing on grounds that smoothed contours do not honour the linear character of the source data. Therefore, the application of smoothing procedures for aesthetic purposes should be in respect to the geometrical properties of the source data. A popular method to smooth contour lines consists in smoothing each contour independently of the rest. This approach is often referred to as line smoothing. A second approach engages the distillation of contour lines from smooth surface patches. An eclectic procedure has been worked out to comprise the advantages and minimize the drawbacks of both approaches. The eclectic method has been refined in order to adjust the smoothing according to the user preferences or needs. Furthermore, optimisation algorithms have been added which, depending on the geometrical properties of the vertices of the raw lines, adapt the smoothing of the contours, thus increasing the geometrical integrity of the smoothed lines.

References

- Christensen A. 2001. Contour smoothing by an eclectic procedure. *Photogrammetric Engineering and Remote Sensing* 67:511-517.
- McCullagh M.J. 1981. Creation of smooth contours over irregularly distributed data using Local Surface Patches. *Geographical Analysis* 13:51-63.
- Monahan D. and Casey M.J. 1985. Contours and contouring in Hydrography. Part 1: The fundamental issues. *International Hydrographic Review* 62:105-120.